

CLAIMS

What is claimed is:

5           1.     An isolated nucleic acid, comprising a nucleotide sequence encoding a human Nit2 protein, wherein the nucleotide sequence is a cDNA sequence.

          2.     The isolated nucleic acid of **Claim 1**, wherein said nucleotide sequence encodes a human Nit2 protein having an amino acid sequence of **SEQ. ID. NO: 1**.

          3.     The isolated nucleic acid of **Claim 1**, comprising a nucleotide sequence of **SEQ. ID. NO: 8**.

15           4.     A human Nit2 protein.

          5.     The isolated protein of **Claim 4**, comprising an amino acid sequence of **SEQ. ID. NO: 1**.

20           6.     An antibody which specifically binds to an epitope of a human Nit2 protein.

          7.     An isolated nucleic acid, comprising a nucleotide sequence encoding a mouse Nit2 protein, wherein the nucleotide sequence is a cDNA sequence.

          8.     The isolated nucleic acid of **Claim 7**, wherein said nucleotide sequence encodes a mouse Nit2 protein having an amino acid sequence of **SEQ. ID. NO: 2**.

30           9.     The isolated nucleic acid of Claim 7, comprising a nucleotide sequence of **SEQ. ID. NO:9**.

          10.    A mouse Nit2 protein.

11. The isolated protein of Claim 10, comprising an amino acid sequence of SEQ. ID. NO: 2.

5 12. An antibody which specifically binds to an epitope of a mouse Nit2 protein.

13. An *S. pombe* Nit2 protein.

10 14. The isolated protein of **Claim 13**, comprising an amino acid sequence of SEQ. ID. NO: 7.

15 15. An antibody which specifically binds to an epitope of a *S. pombe* Nit2 protein.

16. An *S. cerevisiae* Nit3 protein.

20 17. The isolated protein of Claim 16, comprising an amino acid sequence of SEQ. ID. NO: 5.

25 18. An antibody which specifically binds to an epitope of a *S. cerevisiae* Nit3 protein.

30 19. An isolated nucleic acid, comprising a nucleotide sequence encoding a X.laevis Nit1 protein, wherein the nucleotide sequence is a cDNA sequence.

20. The isolated nucleic acid of Claim 19, wherein said nucleotide sequence encodes a X. laevis Nit1 protein having an amino acid sequence of **SEQ. ID. NO: 3**.

30 21. The isolated nucleic acid of **Claim 19**, comprising a nucleotide sequence of **SEQ. ID. NO: 10**.

22. A *X. laevis* Nit1 protein.

23. The isolated protein of **Claim 22**, comprising an amino acid sequence of SEQ. ID. NO: 3.

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24. An antibody which specifically binds to an epitope of a *X. laevis* Nit1 protein.

25. A *S. pombe* Nit1 protein.

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26. The isolated protein of **Claim 25**, comprising an amino acid sequence of SEQ. ID. NO: 6.

27. An antibody which specifically binds to an epitope of a *S. pombe* Nit1 protein.

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28. An *S. cerevisiae* Nit2 protein.

29. The isolated protein of **Claim 28**, comprising an amino acid sequence of SEQ. ID. NO: 4.

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30. An antibody which specifically binds to an epitope of a *S. cerevisiae* Nit2 protein.

25 31. A method of identifying a molecule that specifically binds to a Nit2 protein and is functionally active in mimicking a Fhit interaction, comprising

a) contacting said Nit2 with a plurality of molecules under conditions conducive to binding between said Nit2 and said molecules; and

b) identifying a molecule within said plurality of molecules that specifically binds to said Nit2 and is functionally active in mimicking said Fhit interaction.

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32. A compound comprising a Fhit mimic, wherein said mimic binds to a Nit2 protein in any cell and is functionally active in mimicking a Fhit interaction.

33. A method of treating a disease state in which an activity of a Nit2  
5 protein is altered in a mammal, comprising administering a therapeutically effective amount of a Fhit mimic, wherein said Fhit mimic binds to said Nit2 protein, thereby inducing programmed cell death.

34. The method of **Claim 33**, wherein said disease comprises a  
10 proliferative disorder.

35. A pharmaceutical composition comprising a Fhit mimic.

36. A method of identifying a molecule that specifically binds to a Nit2  
15 protein and is functionally active in antagonizing a Fhit interaction, comprising

a) contacting said Nit2 with a plurality of molecules under conditions conducive to binding between said Nit2 and said molecules; and

b) identifying a molecule within said plurality of molecules that specifically binds to said Nit2 and is functionally active in antagonizing said Fhit  
20 interaction.

37. A compound comprising a Fhit antagonist, wherein said antagonist binds to a Nit2 protein in any cell and is functionally active in antagonizing a Fhit  
25 interaction.

38. A method of treating a disease state in which an activity of a Nit2 protein is altered in a mammal, comprising administering a therapeutically effective amount of a Fhit antagonist, wherein said Fhit antagonist binds to said Nit2 protein, thereby promoting cell proliferation.  
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39. The method of **Claim 38**, wherein said disease comprises a degenerative disease.

40. A pharmaceutical composition comprising a Fhit antagonist.